REMARKS/ARGUMENTS

Applicants have studied the Office Action dated November 4, 2005. It is submitted that the application is currently in condition for allowance. Reconsideration and allowance of the pending claims in view of the following remarks is respectfully requested.

In the Office Action, the Examiner:

(Page 2) accepted the specification;

(Page 2) withdrew objection to the drawings;

(Page 2) withdrew objection to the claims;

(Items 1-7) rejected claims 1-4, 13, 14, and 18 under 35 U.S.C. § 102(b) as being anticipated by Subramanian et al. (U.S. Patent No. 6,348,406 B1);

(Item 8) rejected claims 5-6 under 35 U.S.C. § 103(a) as being unpatentable over Subramanian et al. (U.S. Patent No. 6,348,406) in view of Tanaka et al. (U.S. Patent Publication No. 2003/0165750); and

(Items 9-14) rejected claims 9-12 under 35 U.S.C. § 103(a) as being unpatentable over Subramanian et al. (U.S. Patent No. 6,348,406) in view of S. Wolf "Silicon Processing for the VLSI Era", Vol. 1.

(Page 2) Acceptance and withdraw of the objections

The Applicants wish to thank Examiner Kim for accepting the specification as previously amended and for withdrawing previously made objections to the drawings and to claim 19, in light of Applicants' previous amendments.

(Items 1-8) Rejection under 35 U.S.C. §102(b) Subramanian et al.

As noted above, the Examiner rejected claims 1-4, 13-14, and 18 under 35 U.S.C. § 102(b) as being anticipated by Subramanian et al. (U.S. Patent No. 6,348,406). This rejection is respectfully traversed.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Independent claim 1 recites, *inter alia*:

> ... with the precursor stacks being at least partially covered by a protective resin and being separated by a formation zone for a source line;
>
> forming a trench in the formation zone for the source line by an attack of the formation zone and of the protective resin so as to result in a deposit of residue from the protective resin the precursor stacks;
>
> removing the deposit of residue; and
>
> implanting a source line in the formation zone. (emphasis added)

The present invention discloses a novel process for memory device fabrication. As described in the specification of the instant application, an "etching stage [ ] partially attacks a protective resin 14, which creates a deposit of polymers 15 in the hollow below the stack." Para 0032, and FIG. 3. The result is a deposit of residue (15) formed **directly below** a portion of the precursor stack (31, 32). *See* FIG. 3

Importantly, the method also teaches to remove this deposit (see reference # 16 in FIG. 4) *before the implantation of the source line* (see reference # 7 in FIG. 5). This leads to the implantation of a source line that actually **extends below a portion of** the precursor stack. See FIG. 6. A Flash memory made by the process of the present invention greatly reduces memory erasing time while only moderately modifying the manufacturing process.

Subramanian et al. provide a method for manufacturing a semiconductor device with an anti-reflective coating (ARC) that can be used as a hard mask and does not need to be removed. Column 6, lines 31-55 of Subramanian et al. describes its different layers.

- Layer 212 is a gate dielectric layer intended for forming a tunnel oxide layer. Subramanian, col. 6, lines 31-37.
- Layer 214 is a floating gate layer. *Id.*, col. 6, lines 37-40.
- Layer 216 is an interpoly dielectric. *Id.*, col. 6, lines 49-57.

- Layer 218 is a layer of conductive polysilicon forming the control gate. *Id.*, col. 6, lines 57-62.

- Layers 226 and 228 form the passivation layer. *Id.*, col. 7, lines 12-19.

Thus, contrary to the Examiner's conclusion on page 6 of the Office Action, Subramanian et al. disclose a layer 212 which is not a protective layer for the precursor stack. Layer 212 **belongs to the stack 210** and the rest of the stack is formed over this layer 212 (for instance, the floating gate 214). Therefore, the attack of layer 212 cannot be considered as an attack of the claimed protective resin, but is instead an attack of part of the **precursor stack**.

Even if, as the Examiner concludes on page 6 of the Office Action, layer 318 is to be considered a protective resin, Subramanian *only* discloses chemical mechanical polishing of the surface of layer 318. A trench is never formed for the source line, *especially* since the source line 202 is formed **before** layer 318 is ever implanted. Subramanian, col. 7, lines 59-60, 65-67, and FIG. 2C. In contrast, the present invention implants the source line **after** removal of the protective resin.

Moreover, Subramanian et al. do not teach that this etching leads to a residue under the stack 210, or specifically, Subramanian et al. is completely silent on a deposit of a residue under layer 212, which, as explained two paragraphs above, is part of the stack.

Continuing on, Subramanian et al. also do not teach a further removal step between the etching of layer 212 and the implantation of the source. *See* Subramanian, col. 7, lines 34-39 and FIG. 2D. As explicitly taught by Subramanian et al., implantation of the source line directly follows the etching of layer 212. Col. 6, lines 31-40. Thus, arguendo, even if layer 212 were to be considered a deposit of residue under the precursor stack, the source 202 is located under the residue deposit 212, and Subramanian never teaches, suggests, or discusses removal of layer 212 (if this were the residue).

Therefore, Subramanian et al. do not teach *forming a trench in the formation zone* ***for the source line*** *by an attack of the formation zone and of the protective resin so as to result in a deposit of residue from the protective resin below the precursor stacks.* Nor does it teach *removing the deposit of residue; and implanting a source line in the formation zone below the precursor stacks.*

Subramanian discloses a solved technical problem—reducing the cost and complexity of the removal of an ARC layer. Col. 3, lines 38-47. The applicants do not contest that Subramanian solves a technical problem but do contest that Subramanian solves the technical problem of the present invention, which is to increase the distance of the implantation of the source line under a precursor stack. This problem is not dealt with in Subramanian.

Subramanian only relate to treatments for the interconnection of the source line, once the source line is already implanted. A dielectric layer is etched at this stage only to uncover part of an implanted source line and then deposit a conductive layer to form a contact with this source line.

Thus, the removal of part of this dielectric layer in Subramanian et al. does not lead to a residue located directly under the stack. Further, this etching step is followed by a conductive layer deposit and not by a further implantation of the source line, as in the presently claimed invention, since the source line of Subramanian et al. was implanted previously. Thus, these steps have absolutely no influence on the distance of implantation of the source line under the stack.

The invention cannot be derived from Subramanian et al. There is no teaching or suggesting in Subramanian et al. of the deposit of residue of polymers under the precursor stack and the removal of residue polymers before the implantation.

The Examiner cites 35 U.S.C. § 102(b) and a proper rejection requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims as being anticipated by Subramanian et al.[1] Because the elements in

[1] See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal*

independent claim 1 of the instant application are not taught or disclosed by Subramanian et al., the apparatus of Subramanian et al. does not anticipate the present invention. The dependent claims are believed to be patentable as well because they all are ultimately dependent on either claim 1. Accordingly, the present invention distinguishes over Subramanian et al. for at least this reason. The Applicants respectfully submit that the Examiner's rejection under 35 U.S.C. § 102(b) has been overcome.

Rejections under 35 U.S.C. §103(a) in view of Subramanian and Tanaka

As noted above, the Examiner rejected claims 5-6 under 35 U.S.C. § 103(a) as being unpatentable over Subramanian et al. (U.S. Patent No. 6,348,406) in view of Tanaka et al. (U.S. Patent Publication No. 2003/0165750).

Claims 5-6 depend from independent claim 1. Since dependent claims contain all the limitations of independent claims, claims 5-6 also distinguish over Subramanian for the reasons above, which will not be repeated here.

As the Examiner correctly stated on page 9 of the office action, Subramanian does not disclose "*wherein forming of the trench 202 includes forming a trench so as to result in the protective resin formed of thick I-line resin*". The Examiner goes on to combine Subramanian with Tanaka stating that Tanaka teaches "*wherein forming of the trench 202 includes forming a trench so as to result in the protective resin formed of thick I-line resin (column 6 lines 48-54)*".[2]

Tanaka teaches a method of manufacturing an electronic device. Nowhere does Tanaka teach, anticipate, or suggest "...the precursor stacks being at least partially covered by a protective resin and being separated by a formation zone for a source line; forming a trench in the formation zone for the source line by an attack of the

---

Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

[2] Applicants make no statement whether such combination is even proper.

formation zone and of the protective resin so as to result in a deposit of residue from the protective resin below the precursor stacks; removing the deposit of residue...".

Accordingly, the limitations taken "as a whole" in claim 1 are not present in Subramanian taken alone or in view of Tanaka. Claim 1, therefore, distinguishes over Subramanian taken alone and/or in combination with Tanaka for at least this reason.

Further, when there is no suggestion or teaching in the prior art for "...the precursor stacks being at least partially covered by a protective resin and being separated by a formation zone for a source line; forming a trench in the formation zone for the source line by an attack of the formation zone and of the protective resin so as to result in a deposit of residue from the protective resin below at least a portion of the precursor stacks; removing the deposit of residue..." the suggestion cannot come from the Applicants' own specification. The Federal Circuit has repeatedly warned against using the Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings of the prior art. See MPEP §2143 and Grain Processing Corp. v. American Maize-Products, 840 F.2d 902, 907, 5 USPQ2d 1788 1792 (Fed. Cir. 1988) and In re Fitch, 972 F.2d 160, 12 USPQ2d 1780, 1783-84 (Fed. Cir. 1992).

For the foregoing reasons, independent claim 1 distinguishes over Subramanian taken alone and/or in view of Tanaka. Claims 5-6 depend from claim 1. Since dependent claims contain all the limitations of the independent claims, claims 5-6 distinguish over Subramanian taken alone and/or in view of Tanaka, as well, and the Examiner's rejection should be withdrawn.

Rejections under 35 U.S.C. §103(a) in view of Subramanian and S. Wolf

As noted above, the Examiner rejected claims 9-12 under 35 U.S.C. § 103(a) as being unpatentable over Subramanian et al. (U.S. Patent No. 6,348,406) in view of S. Wolf "Silicon Processing for the VLSI Era", Vol. 1.

Claims 9-12 depend from independent claims 1. Since dependent claims contain all the limitation of independent claims, claims 9-12 also distinguish over Subramanian for

the reasons above, which will not be repeated here.

As the Examiner correctly stated on page 10 of the office action, Subramanian does not teach "*the removing of the deposit of residue includes removing the deposit of residue by generating dioxygen plasma*". However, the Examiner went on to combine Subramanian with S. Wolf stating that S. Wolf teaches "*removing of the deposit of residue includes removing the deposit of residue by generating dioxygen plasma*".[3]

Nowhere does S. Wolf teach a protective resin that is attacked resulting in a deposit of residue from the protective resin below precursor stacks, as recited for claim 1. Accordingly, S. Wolf is completely silent on "...the precursor stacks being at least partially covered by a protective resin and being separated by a formation zone for a source line; forming a trench in the formation zone for the source line by an attack of the formation zone and of the protective resin so as to result in a deposit of residue from the protective resin below the precursor stacks; removing the deposit of residue..." and the present invention distinguishes fro S. Wolf for at least this reason.

Therefore, the limitations taken "as a whole" in claim 1 are not present in Subramanian taken alone or in view of S. Wolf and claim 1 distinguishes over Subramanian taken alone and/or in combination with S. Wolf for at least this reason.

Further, when there is no suggestion or teaching in the prior art for "...the precursor stacks being at least partially covered by a protective resin and being separated by a formation zone for a source line; forming a trench in the formation zone for the source line by an attack of the formation zone and of the protective resin so as to result in a deposit of residue from the protective resin below the precursor stacks; removing the deposit of residue..." the suggestion cannot come from the Applicants' own specification. The Federal Circuit has repeatedly warned against using the Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings

[3]Applicants make no statement whether such combination is even proper.

of the prior art. See MPEP §2143 and Grain Processing Corp. v. American Maize-Products, 840 F.2d 902, 907, 5 USPQ2d 1788 1792 (Fed. Cir. 1988) and In re Fitch, 972 F.2d 160, 12 USPQ2d 1780, 1783-84 (Fed. Cir. 1992).

For the foregoing reasons, independent claim 1 distinguishes over Subramanian taken alone and/or in view of S. Wolf. Claims 9-12 depend from claim 1. Since dependent claims contain all the limitations of the independent claims, claims 9-12 distinguish over Subramanian taken alone and/or in view of S. Wolf, as well, and the Examiner's rejection should be withdrawn.

CONCLUSION

The remaining cited references have been reviewed and are not believed to affect the patentability of the claims as amended.

In this Response, Applicant has amended certain claims. In light of the Office Action, Applicant believes these amendments serve a useful clarification purpose, and are desirable for clarification purposes, independent of patentability. Accordingly, Applicants respectfully submit that the claim amendments do not limit the range of any permissible equivalents.

Applicant acknowledges the continuing duty of candor and good faith to disclosure of information known to be material to the examination of this application. In accordance with 37 CFR §1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment are limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicants and their attorneys.

Applicants respectfully submit that all of the grounds for rejection stated in the Examiner's Office Action have been overcome, and that all claims in the application are allowable. No new matter has been added. It is believed that the application is now in

condition for allowance, which allowance is respectfully requested.

It is believed that no fee is due with this Amendment. However, if any fees are due with respect to Sections 1.16 or 1.17, please charge to the deposit account of the undersigned firm, Acct. No. 09-0463.

PLEASE CALL the undersigned if that would expedite the prosecution of this application.

Respectfully submitted,

Date: January 4, 2006

By: _____
Scott Smiley, Reg. No. 55,627
Attorney for Applicants

By: _____
Jon Gibbons, Reg. No. 37,333
Attorney for Applicants

FLEIT, KAIN, GIBBONS, GUTMAN BONGINI & BIANCO P.L.
551 N.W. 77th Street, Suite 111
Boca Raton, FL 33487
Tel (561) 989-9811
Fax (561) 989-9812

Please Direct All Future Correspondence to Customer Number **23334**